Center Independent Research & Development: GSFC IRAD

Developing a non high voltage electron detector using magnetic deflection and a Charge-Coupled Device

Completed Technology Project (2014 - 2016)

Project Introduction

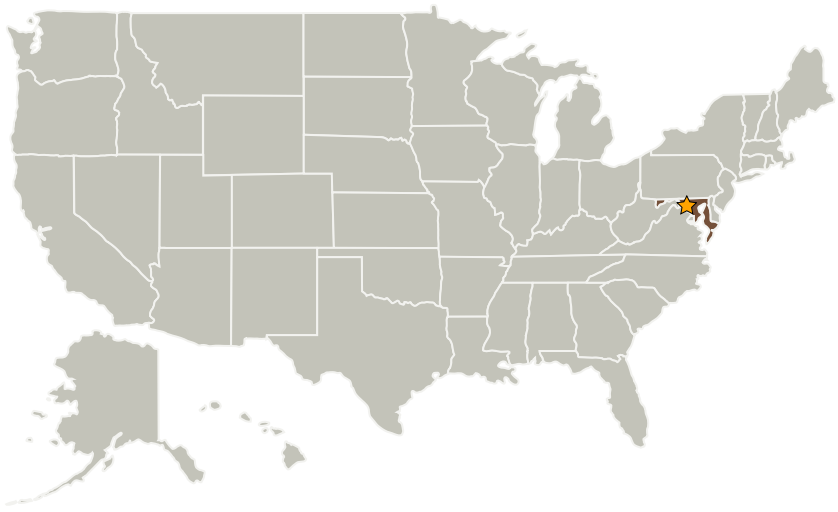
We plan to characterize the response of a Charge-Coupled Device (CCD) to electrons of different energies and to optimize the placement of a specific magnetic deflection system relative to the CCD for energy selection.

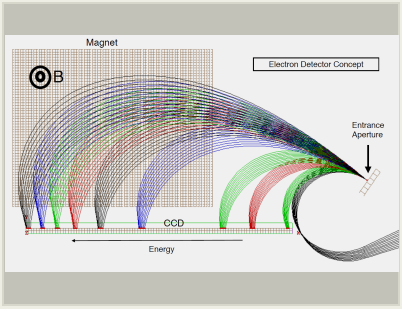
The main objective of the project is to advance a proof-of-concept electron spectrometer design that does not need any high voltage, which represents technology maturation for risk reduction. The expected end goal of the project is to evaluate the performance characteristics of such a detector concept in order to better define the potential scientific uses.

Anticipated Benefits

This project will benefit a planned sub-orbital mission, where a CCD based instrument could be used to measure auroral electron precipitation, and represents technology maturation for risk reduction. It also has the potential to benefit future satellite missions studying the Earth's ionosphere and magnetosphere.

Primary U.S. Work Locations and Key Partners





Non high voltage electron detector

Table of Contents

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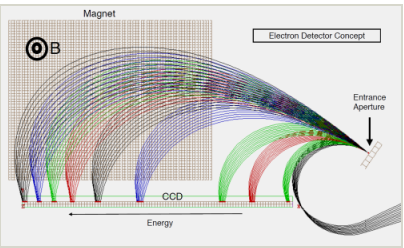
Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
University of Maryland-College Park(UMCP)	Supporting Organization	Academia	College Park, Maryland

Primary U.S. Work Locations
Maryland

Images



Non high voltage electron detector
Non high voltage electron detector *(https://techport.nasa.gov/image/20759)*

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

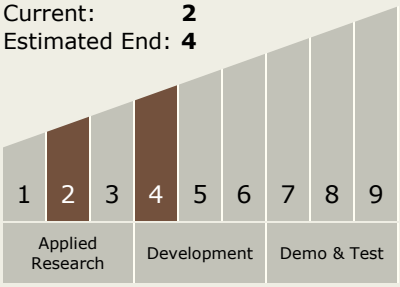
Program Manager:
Peter M Hughes

Project Manager:
Nikolaos Paschalidis

Principal Investigator:
Maria Samara

Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes